

CLAIMS

- 1 1. A capacitive sensing apparatus having a steerable sensing field
2 comprising:
3 a power source having a first ground connection;
4 at least one sensing circuit in communication with said power source,
5 said sensing circuit having a signal processing circuit and an oscillator circuit
6 wherein said oscillator circuit includes an oscillator and at least one sensing
7 element; and
8 at least one conductive element in communication with a second ground
9 connection, said at least one conductive element disposed adjacent said sensing
10 element and operative to attract a portion of the sensing field of the at least one
11 sensing element such that the sensing field is made steerable by changing
12 position of either a portion of the at least one sensing element or a portion of
13 the at least one conductive element relative to one another.
- 1 2. The capacitive sensing apparatus of claim 1 wherein the at least
2 one sensing circuit is at least one meter from said power source.
- 1 3. The capacitive sensing apparatus of claim 2 wherein the at least
2 one sensing element is a portion of an inductor and wherein the at least one
3 sensing circuit includes a local ground connection at the inductor.
- 1 4. The capacitive sensing apparatus of claim 3 wherein the local
2 ground is provided by a metal plate capacitively coupled to earth ground.
- 1 5. The capacitive sensing apparatus of claim 1 wherein the at least
2 one sensing circuit includes an isolation transformer disposed between said
3 power source and said at least one sensing element whereby said at least one
4 sensing element is isolated from the power source ground.

1 6. The capacitive sensing apparatus of claim 5 wherein the
2 isolation transformer includes first and second coils having opposing ends, said
3 first coil being connected to said oscillator at both ends and said second coil
4 being connected to said at least one sensing element at one end and to a local
5 ground at the other end.

1 7. The capacitive sensing apparatus of claim 5 wherein the
2 isolation transformer includes first and second coils having opposing ends, said
3 first coil being connected to said oscillator at both ends and said second coil
4 being connected to a first sensing element at one end and connected to a second
5 sensing element at the other end.

1 8. The capacitive sensing apparatus of claim 7 wherein said first
2 sensing element is larger than said second sensing element.

1 9. The capacitive sensing apparatus of claim 1 wherein the sensing
2 element is formed of a metallic tape.

1 10. The capacitive sensing apparatus of claim 1 wherein the sensing
2 element is formed of a metallic screen material.

1 11. The capacitive sensing apparatus of claim 1 wherein the sensing
2 element is formed of a metal plate.

1 12. The capacitive sensing apparatus of claim 1 further comprising a
2 housing having said sensing element and said conductive element disposed
3 therein, said housing operative to fixedly support said sensing element and said
4 conductive element at a predetermined distance relative to one another.

1 13. The capacitive sensing apparatus of claim 1 wherein said
2 sensing element and said conductive element are disposed on an overhead
3 garage door.

1 14. The capacitive sensing apparatus of claim 1 wherein said
2 sensing element and said conductive element are disposed on a sliding security
3 gate.

1 15. The capacitive sensing apparatus of claim 1 wherein said
2 sensing element and said conductive element are disposed on an artifact display
3 case.

1 16. A method of steering sensing fields of an object detection
2 apparatus comprising the steps of:

3 providing a power source having a first ground connection;
4 providing at least one sensing circuit in communication with said power
5 source, said sensing circuit having a signal processing circuit and an oscillator
6 circuit wherein said oscillator circuit includes an oscillator and at least one
7 sensing element; and

8 providing at least one conductive element in communication with a
9 second ground connection, said at least one conductive element disposed
10 adjacent said sensing element and operative to attract a portion of the sensing
11 field of the at least one sensing element such that a portion of the sensing field
12 is made steerable by changing position of either a portion of the at least one
13 sensing element or a portion of the at least one conductive element relative to
14 one another.

1 17. The method of claim 16 further comprising the step of providing
2 a housing that supports said at least one sensing element and said at least one
3 conductive element therein at a predetermined distance.